

Note to readers with disabilities: *EHP* strives to ensure that all journal content is accessible to all readers. However, some figures and Supplemental Material published in *EHP* articles may not conform to [508 standards](#) due to the complexity of the information being presented. If you need assistance accessing journal content, please contact ehp508@niehs.nih.gov. Our staff will work with you to assess and meet your accessibility needs within 3 working days.

Supplemental Material

Historical Prediction Modeling Approach for Estimating Long-Term Concentrations of PM_{2.5} in Cohort Studies before the 1999 Implementation of Widespread Monitoring

Sun-Young Kim, Casey Olives, Lianne Sheppard, Paul D. Sampson, Timothy V. Larson, Joshua P. Keller, and Joel D. Kaufman

Table of Contents

Table S1. List of geographic variables

Table S2. Cross-validation statistics of the historical PM_{2.5} models for 1999-2010 by year and region

Table S3. Regression coefficients of cross-validated predictions against observations from the historical PM_{2.5} model by year and three regions from 1999 through 2010

Table S4. Proportion of total variance of the cross-validated predictions captured by the long-term mean, the temporal trend, and spatio-temporal residuals across FRM and IMPROVE sites

Table S5. Regression coefficients of predictions against observations from the historical PM_{2.5} model using IMPROVE data for 1990-1998 by year and region

Table S6. Regression coefficients of predictions against observations from the historical PM_{2.5} models using CHS, CARB dichot, and IPN data by year

Figure S1. Number of monitoring sites for PM_{2.5} in FRM and IMPROVE from 1999 through 2010

Figure S2. Time-series plots of annual averages for $PM_{2.5}$ across FRM and IMPROVE sites for 1999-2010 by region

Figure S3. Estimated regression and variance parameters of the $PM_{2.5}$ prediction model for 1980-2010

Figure S4. Loadings of geographic variables for two PLS predictors by the long-term mean and trend coefficient

Figure S5. Scatter plots of observed and predicted $PM_{2.5}$ annual averages from the $PM_{2.5}$ historical model using the FRM/IMPROVE $PM_{2.5}$ trend across CHS sites for 1994-2003

Figure S6. Scatter plots of observed and predicted $PM_{2.5}$ annual averages from the $PM_{2.5}$ historical model using the FRM/IMPROVE $PM_{2.5}$ trend across CARB dichot sites for 1988-2001

Figure S7. Scatter plots of observed and predicted $PM_{2.5}$ annual averages from the $PM_{2.5}$ historical model using the FRM/IMPROVE $PM_{2.5}$ trend across IPN sites for 1980-1981

Figure S8. Boxplots and spaghetti plots of differences between maximum and minimum of predicted $PM_{2.5}$ annual averages across three trend estimation approaches over years at IMPROVE sites

Figure S9. Maps of differences between maximum and minimum of predicted $PM_{2.5}$ annual averages across three trend estimation approaches at IMPROVE sites in 1980, 1985, 1990 and 1998

Figure S10. Scatter plots of predicted $PM_{2.5}$ annual averages from the 31-year $PM_{2.5}$ model using the extrapolated temporal trend based on $PM_{2.5}$ data for 1999-2010 for 2000 vs. long-term averages for 1980-2000 weighted by times of residences across home addresses of 5,086 participants who never moved for 1980-2000 and 2,466 MESA/MESA Air participants who moved at least once by six MESA metropolitan areas